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[001] ARRANGEMENT FOR SECURING A SNAP RING

This application is a national stage completion of PCT/EP2004/000296 filed January 16, 2004 which claims priority from German Application Serial No. 103 02 075.6 filed January 21, 2003.

[002] FIELD OF THE INVENTION

[003] ~~According to the preamble of claim 1, t~~The invention relates to an arrangement for axial support of two jointly rotating components by means of a snap ring.

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[004] BACKGROUND OF THE INVENTION

[005] The axial support by way of a snap ring of components, for example, of a ball bearing or a gear wheel, jointly rotating upon a shaft, is already known. The snap ring is not closed, but has a gap extending in peripheral direction and, therefore, its outer or inner diameter can be changed by elastic deformation. The snap ring is held on the shaft in a narrowly tolerated annular groove. The snap ring can also be inserted in an annular groove of a hollow part such as a hole. The snap ring is conventionally secured on its groove only by its tension. Under certain operating conditions, like high peripheral speeds associated with vibrations, said spring tension does not suffice to keep the snap ring in its groove. On the contrary, it can happen that the snap ring emerges from its groove and thus can no longer fulfill its function of axial fixing function. This can result in sensitive damages.

[006] The object of this invention is, therefore, to provide for an arrangement of the above mentioned kind of snap ring securing device which prevents the snap ring from leaving its annular groove with no further added expenses resulting.

[007] This problem is solved with the features of claim 1. According to the invention, ramps are provided in the area of the impacting ends which prevent the snap ring from springing in or out in the area. The impacting ends are thus secured with a positive fit against radial movements. Depending on whether the snap ring is situated in a hole or on a shaft, the ramps are disposed either radially within or radially without the impacting ends.

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[009] ~~Advantageous structures of the invention result from the sub-claims.~~ With each impacting end, a single ramp is coordinated, which presents a springing in or out of each impacting end in radial direction. Between the two impacting ends, it is advantageous to situate one stop in the peripheral gap which presents a twisting of the snap ring. Thereby the impacting ends of the snap ring are kept in the sphere of action of the ramps and the snap ring can no longer spontaneously leave the annular groove. The stop between the two impacting ends can be advantageously designed as knubs. Knubs and ramps have an axial extension in the area of the axial thickness of the snap ring, preferably somewhat smaller. It is further advantageous that the components be designed as sheet metal components and the ramps and/or the knubs be stamped from the sheet metal component or components. Such a stamping is practically neutral in cost, since the stamping tool concerned requires only a small change. It is further advantageous that the ends of the snap ring be designed before the impacting ends non-torsionally around an axis extending in peripheral direction. This is of advantage in the assembling of the snap rings mounted in the annular groove since the snap ring ends slide over the ramps during the assembly becoming axially twisted and finally snap in or lock behind the ramps. It is an advantage of the snap ring if per se too non-torsional to reduce the cross-section in radial direction. By way of this simple step, the desired torsional stiffness is obtained in the area of the impacting ends. Finally, it is advantageous that the supported and/or to be supported sheet metal components are parts of a multi-disc clutch, that is, disc carriers. Snap rings are used under extremely limited installation conditions for axial fixing of a disc set under axial pressure and are also, at the same time, subjected to vibration stresses. The inventive securing of the snap ring by way of ramps and knubs is of particular advantage in this embodiment of a multi-disc clutch.